Instrumentation Plan for FY04

LARP Collaboration Meeting

16-18 September, 2003

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Luminosity Monitor

- Characterize prototype lumi
  - Test 40 MHz performance with goal 1% measurement of bunch-bunch luminosity
    - Possible ALS storage ring test with 40 MHz beam
    - SPS 40 MHz beam test in May 04
    - Alternate source of 40 MHz beam
  - Test detector performance with 1 Hz ALS booster beam
    - Signal gain with voltage, gas pressure, type
    - Simultaneous studies of CERN CdTe detector
  - Resolve mechanical issues for production in second prototype
- Desired funding: 0.75 Sci, 0.1 Designer, 40k$ M&S
- Baseline budget: 0.5 Sci, 0.1 Designer, 40k$ M&S

Longitudinal Density Monitoring

- Abort Gap Monitoring for machine protection
  - Required for day 1 operation
  - Separate from optical sampling system
  - Requires assessment for LHC (white paper study)
    - Wall current monitor
    - SR monitor
  - Implementation TBD in FY05
- Optical sampling system (aka laser-thing)
  - Begin laser engineering for LHC (possible LBL purchase of laser)
  - Continue development of system (electronics, machine studies.)
- Desired funding: 0.75 Sci/Eng
- Proposed budget: 0.0 Sci/Eng, 0.0 Designer, 0k$ M&S

Tune control

BNL

- Simulations of Beam/PLL dynamics for SPS (joint AP/Instrumentation)
- SPS beam test of PLL. Requires manpower support.
- Baseline budget: 63 k$ sufficient

- FNAL
  - Study multiple oscillator PLLs for application
  - Steady/pulsed excitation
  - Study tune tracking at tune crossing
  - Baseline budget: 63k$

Additional instrumentation

- Several topics discussed
  - Help from FNAL for Schottky monitor in SPS for by Apr 04
  - Zero Degree Calorimeters (possible funding from DOE Nuclear Physics) for heavy ion luminosity monitoring and possibly p-p. Study compatibility with baseline lumi monitor.
  - Novel halo monitors using SR from μ-wiggler
  - Consumable collimators
  - AC dipole for non-resonant beam excitation
  - Beam-beam compensation techniques